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THE UNIVERSITY OF ALBERTA

NONVERBAL COMMUNICATION

BETWEEN MOTHER AND PRESCHOOL CHILD



by

EDWIN DARRAH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

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The undersigned certify that they have read, and  
recommend to the Faculty of Graduate Studies for acceptance,  
a thesis entitled "Nonverbal Communication Between Mother  
and Preschool Child" submitted by Edwin G. Darrah in  
partial fulfilment of the requirements for the degree of  
Master of Education.



## ABSTRACT

Preverbal children communicate their wants, desires and intents nonverbally. These are facilitated by the warmth of the mother-child relationship. The present study examines the nonverbal communication as affected by the mother-child relationship. The author hypothesized that maternal control would be differentially related to the nonverbal communication in the mother-child dyad. Maternal control was hypothesized to relate positively with positive, total and range of nonverbal behavior but negatively with negative nonverbal behavior. The author also hypothesized that nonverbal communication would be differentially related to the cognitive development of the child. More specifically, it was hypothesized that positive nonverbal behavior, total nonverbal behavior, and total range of nonverbal behavior would be positively related to the child's cognitive growth whereas negative nonverbal behavior would be negatively related to the child's cognitive development.

Thirty-two mother-child dyads were selected from a representative middle socio-economic area of the city of Edmonton. None of the children, who ranged in age from four years to four years and eleven months, had kindergarten experience. The mother-child interactions were recorded on videotapes. The tapes were analyzed in terms of nonverbal variables that were hypothesized to be measures of the mother's and child's nonverbal participation. Correlations were made with separate measures of the mother's maternal attitude. The mother's maternal attitude was determined by Brady (1969) in his doctoral dissertation. The affective quality of the relationship between the child and his mother, namely warmth (as indicated by positive nonverbal cues) was measured.

The findings, as predicted, demonstrated that maternal control was negatively related to warmth as defined by the positive nonverbal





behaviors. As well, maternal control was negatively related to total, and range of, nonverbal participation were positively related to a measure of the child's cognitive behavior, namely reflectiveness. Negative nonverbal behavior and total range of nonverbal participation were found to correlate significantly with children's achievement. Thus the author concluded that warmth seemed to be a condition for facilitating nonverbal participation between mother and child and this in turn affected his cognitive behavior.





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## CHAPTER 1

### STATEMENT OF THE PROBLEM

The purpose of this research is to investigate the relationship of nonverbal communication of the mother-child pair to maternal control and the cognitive behavior of the child.

The present study extended the data collected by Brady (1969) for his doctoral dissertation. Brady investigated the warmth of the mother-child relationship and how it related to verbal and non-verbal participation, cognitive behavior of the child and the personality of the mother.

It is generally accepted that individuals vary in degrees of cognitive ability as a result of both innate differences and environmental factors. Hunt (1961) developed the position that cognitive ability is not primarily genetically determined but develops in and through the process of interaction with the environment. Since the environment includes every member of the family the behavior of each individual within the family must be related to and dependent upon the behavior of all the others. It would then follow that the central factor involved in the effects of deprivation in early childhood is the lack of cognitive and affective meaning in the mother-child communication system. The nature of the mother-child interaction seems important here as a mediating factor in the child's cognitive and motivational behavior. Brady (1969) focuses on the problem when he suggests that maternal communication can facilitate or inhibit the child's cognitive growth. This maternal communication can be either verbal or nonverbal.



Also, communication is a two way process, therefore, how the mother and child participate with each other verbally and nonverbally may be assumed to be important to the child's cognitive development.

Verbal and nonverbal behavior are important modes of communication (Mehrabian, 1968; Knapp, 1960; Hore, 1968; Argyle and Kendon, 1967). As a mode of communication, verbal behavior has been studied fairly extensively. It has been found to relate to the child's style of response, to problem solving situations and to his style of learning (Hess and Shipman, 1965; Templin, 1957).

Until recently, the nonverbal mode of behavior was not considered as significant as verbal behavior. However, more comprehensive evidence is now available in support of the contention that nonverbal behavior is important. Watzlawick (1967) states that nonverbal communication defines the nature of the relationship. Recent studies by Hore (1968) and Brady (1969) seem to indicate that the nonverbal mode is a lasting form of communication and an important mode of communicating between the mother and child. Reik (1948) states, "No small power of communication is contained in a glance, a person's bearing, a bodily movement, a special way of breathing (p. 41)."

Since nonverbal behavior indicates something about human relationships, it seems important to understand nonverbal communication between the mother and child. If nonverbal behavior can serve as an indicator of how the child develops cognitively, then it seems plausible that certain nonverbal behaviors are indicators of facilitation and others of inhibition. Brady's (1969) study, in which he found that nonverbal behavior related to the style of learning of the child, supports this.





Therefore, if the nonverbal mode is not lost, but instead is blended into the whole pattern of communication, it seems important to be aware of its significance and to gain a fuller understanding of it as a specific behavior which relates to the mother's personality, and to the cognitive functioning of the child.



## CHAPTER II

### REVIEW OF LITERATURE

#### Related Literature Comparing Verbal and Nonverbal Communication

In the past the study of communication between the mother and child has largely been restricted to verbal interaction. However this seems to be insufficient; as Galloway (1968) states:

"Without an awareness of nonverbal cues both teachers and parents are greatly deprived of a greater understanding of interaction (p. 42)."

Galloway's comments indicate that the study of nonverbal communication must be considered in the child's development. Various problems have prevented systematic research in nonverbal communication. Ekman (1964) states that the lack of research may, in part, have been due to practical difficulties of research measurement of the nonverbal mode. Furthermore, research investigating nonverbal behavior as a communicative mode, has relied on the application of highly complex verbal concepts for evaluating the information transmitted by the nonverbal cues. All of these factors may have contributed to the lack of understanding we have about communication, particularly nonverbal communication.

In attempting to overcome some of the problems, Ekman (1964) studied both the verbal and nonverbal modes in the same study. In doing so he accounted for some of the nonverbal variables which seem important as modes of communication. He suggested that some nonverbal acts, such as movements towards or away from another, or the direction of eye gaze, communicated specific information in the language of the relationship. Other nonverbal communication such as a smile or fist shake was interpreted as having a direct verbal equivalent or translation.





Mehrabian (1969) adds, "even less symbolic nonverbal acts such as swaying of the body or tapping of the foot has a specific communicative value by emphasizing or focusing attention on a particular part of a verbal message (p. 54)."

In addition to the specific meanings which facilitate the verbal equivalent, nonverbal behavior may also communicate more general or gross information about the sender (Ekman, 1964). Ruesch and Kees (1959) discuss how the nonverbal defines the congruency of the interpersonal interaction in terms of intrapersonal states of awareness. Watzlawick (1967) points out that communication may be viewed as feedback, since the behavior of each person affects and is affected by the behavior of each other person. He adds, "input into such a system may be amplified into change or may be counteracted to maintain stability, depending on whether the feedback mechanisms are positive or negative (p. 31)." He notes that nonverbal communication, as part of the feedback mechanism, is important when relationship is the central issue of communication. He states:

"Indeed wherever relationship is the central issue of communication, we find that digital language (verbal) is almost meaningless. This is not only the case between animals and between man and animals, but in many other contingencies in human life, eg., courtship, love, combat and of course, in all dealings with very young children or severely disturbed mental patients (p. 63)."

In an investigation of the two modes (verbal and nonverbal) Gates (1927) found that children were more accurate in their judgments of facial as compared to vocal expressions of feelings. Levitt (1964) found that adults were just as accurate with the nonverbal mode of communication: the decoding of a consistent facial-vocal communication yielded a judgment equivalent to that obtained from the decoding of the



facial component only - that is, the facial component was dominant. Contrary to the previous findings, Williams and Sundene (1965), dealing with three modes - facial, vocal and combined facial - vocal communication, found that all three modes were important, but observers were better able to judge the emotion more accurately by using the combined facial-vocal communication mode. After studying nursery school children, Brannigan and Humphries (1969) reported that children interacted largely on the basis of communication by expression and gesture. It would appear from the reported research that nonverbal behavior is very important in understanding children's communication, but may be just as important in understanding adults.

Summarizing, it seems important to investigate a mother - child dyadic interaction in terms of the nonverbal mode of communication. This seems important because the nonverbal channel may provide information of the relationship between the mother and child which may not be available through the study of verbal communication alone. The mother-child nonverbal communication system, as a particular part of the social environment, may have psychological relevance in facilitating or inhibiting a child's cognitive growth.

#### Related Nonverbal Literature

The desire to make accurate predictions from nonverbal behavior in terms of gaining a greater understanding of human interaction has brought a multitude of research studies examining many variables. Some of the variables examined include: facial expressions, visual contact, posture, orientation, physical distance and physical contact. It is important to know what these nonverbal cues tell us about the nature of communication so that a better understanding of human relationships is possible.



### Facial Expressions

The facial component has always been considered as important in nonverbal communication. Researchers of facial expressions (Munn, 1940; Pilkington, 1962; Thompson and Meltzer, 1964; Brannigan and Humphries, 1969) report that when studying facial expressions the emphasis is on two areas of the face - the eyes and the mouth.

### Visual Interaction

Establishing communication with another by means of the mutual glance was studied as early as 1933 by Simmel. He believed that one's desire for union with another determines whether one seeks the mutual as distinct from the one-way glance. Consistent with Simmel's belief was Tomkins' argument that mutual awareness of affects occur through mutual looking. He states, "... because of the possibilities of such shared awareness there is no greater intimacy than the interocular experience (Tomkins, 1965, p. 180)." A study by Exline et al., (1965) demonstrated striking differences in willingness to engage in mutual glances by those who were independently judged to differ in their desire to establish warm interpersonal relations. In this case subjects were divided into two groups according to ~~whether~~ they indicated very strong or very weak affection and inclusion orientations toward others. When these persons were then interviewed on personal matters by one instructed to look steadily at them during the interview, those indicating strong affection - inclusion orientation returned the interviewer's glances significantly more than did those whose scale scores indicated a weak affection-inclusion orientation. The striking differences in willingness to look into the line of regard of the other is indicated by the fact that





the visually least active member of the affectionate group looked more steadily at the interviewer than did the most visually active member of the less affectionate group. This is consistent with results obtained by Exline and his co-workers in a number of studies. Brady (1969) demonstrated in a mother-child interaction that controlling mothers spent less time engaged in mutual glancing behavior. In terms of Exline et al., (1965) Brady assumed that the mother-child relationship lacked warmth. Similarly, it was maintained by Kleck and Nuessle (1968) that the amount of eye contact varied directly with the positivity of affect present in the relationship. They add, "the tendency toward mutual glances is significantly higher in persons judged high in their desire to establish warm interpersonal relationships than those low in this trait." The same findings appeared in Efran's (1968) study when a triad was used. More recent and more comprehensive evidence by Mehrabian (1969) supports the relation between positive affect and eye contact:

"The more you like a person, the more time you are likely to spend looking into his eyes as you talk to him (p. 54)."

From the review of the literature it appears reasonable to assume that the incidence of shared glances is related to the type of relationship taking place. Affiliative or affectionate persons, who might be expected to seek involvement with others in contexts whose affective modality is positive or neutral, do indeed engage in more shared glances than do those who might be expected to resist a warm interpersonal relationship.

The relationship between interpersonal affect and mutual glances



can also be considered in terms of factors which act to inhibit or decrease involvement. Tomkins' (1963) discussion of taboos on mutual glances notes how lack of mutual glances will, under certain circumstances, inhibit the desire to become involved and hence affect the incidence of such glances. Exline (1963) argues that competition inhibits mutual glances among high affiliators, and increases it among low affiliators. Likewise, Exline, Gray and Schuette (1965) found embarrassing topics decreased mutual glances in dyads. Exline and Winter (1965) explained the decrease in mutual glances in terms of hiding of affect. They felt that visual avoidance was linked with arousal of painful affect.

Other researchers feel that emotional processes can contribute to the aversion of the gaze. Laing (1960) reported on a series of adult patients who characteristically avert their gaze and found that they were "overwhelmed by a feeling of rejection." Similar results were found by Hutt and Ounsted (1966) in studying aversion of gaze in autistic children. They suggest that this aversion is an "appeasement posture, inhibiting any aggressive or threat behavior on the part of other conspecifics (p. 354)." Consistent with this view is Hutt and Vaizey's (1966) finding that in a room of children, autistic children were never attacked by other children.

A somewhat different view has been presented by some researchers concerning mutual eye contact. Argyle and Dean (1965) put forward the theory that there is an approach-avoidance balance, following the N. E. Miller (1944) model, resulting in an equilibrium level of both eye contact, physical proximity and other components of intimacy. It was





suggested that a shift along one dimension would lead to compensating shifts along the others. This received some support in the experiments by Exline et al., (1965) where it was found that eye contact fell rapidly with physical proximity.

There is some evidence that the recognition of the look in another is instinctive, and that to see a pair of eyes looking at one acts as a releaser for specified social actions. Ambrose (1963) argued that the eyes of another may be the first figural entity consistently perceived by the infant. Furthermore, as Ahrens has shown (cited by Ambrose, 1963), the pair of eyes is the first visual stimulus to elicit a smiling response. The infant's smile and his fixation of the eyes of the person looking at him is seen as component instinctual responses of the infant, which themselves may elicit further approach and caring behavior in the mother (Bowlby, 1958). Kagan (1968) presented four-month-old babies with masks of human faces, some with eyes painted on them and some without. The babies looked longest at the masks which had the painted eyes. Kagan (1968) explained this in terms of the contrast which the eyes provided.

In summary it is reasonable to assume that mutual eye contact is an important factor in a mother and child relationship. This may be viewed as an inherited feature or as a part of the learned communication system but, either way, it seems to relate to the type of relationship taking place and as Brady (1969) has found, relate to the cognitive behavior of the child. What appears to be necessary is to identify other nonverbal visual behaviors and see how they relate to maternal attitude and cognitive behavior in children.



## Mouth Expressions

Despite the acknowledged presence of the mouth as an important part of the facial expression, few extensive experiments have concentrated solely on the mouth. Explaining this, Williams and Tolch (1967) feel that the problem is that each person has his own neutral expression and his ability to encode different facial messages is, in part, a function of the location of his neutral mouth position. Other researchers, (Mehrabian, 1969; Brannigan and Humphries, 1969) believe that the mouth movements should not be considered in isolation because their signal value often depends on their relationship with movements of other parts of the face, particularly the eye region. Brannigan and Humphries (1969) go on to say:

"The friendly impression made by an upper smile is often enhanced by subtle movements beneath and near the outer corners of the eyes. Smiles are also often seen in association with an elevation of the eyebrow → raise (p. 407)."

In studying facial expressions, Cline (1956) used as distinguishing features the profile, eye, eyebrow, nose and mouth. Of these, the eyebrows and the mouth were considered as most important. Using three faces paired into combinations for interaction purposes, Cline (1956) tested the attitude of the interaction. He found that when presented with the faces in interaction, variations in the descriptions of faces were consistent with the changes in the situations in which the pictures were presented. It was found, however, that certain consistent properties were also part of the face. The smiling face (characterized by neutral eyebrows and a smile) for example, was never reported as frowning or glum, but always characteristically deriving pleasure of some sort. Frowning (characterized by elevation of eyebrows and depression of the lips of the mouth) was defined as angry. Glum (characterized by downward slant



of the mouth and neutral eyebrows) was judged to be a response to attack or criticism.

More recent studies by Brannigan and Humphries (1969) approached the understanding of the mouth as a nonverbal communicant in more detail. They have identified thirty-six expressive elements produced by the mouth, some of these grouped as the "smile complex." Smiles are characterized by the mouth corners moving upward and outwards. The friendly impression made by an upper smile, for example, is often enhanced by subtle movements beneath and near the corners of the eyes. When a person is suddenly and pleasantly surprised, raise occurs in the eyebrows and mouth.

Smiles are generally associated with cooperative social contact. Often mouth expressions can also express conflict between people. Anger seems to be shown nonverbally by the eyebrows drawn down, particularly on the inner ends and at the same time the lips are tensed and pushed forwards slightly though the teeth are not shown. An escape expression, especially in a child is characterized by the eyebrows being drawn down at their outer ends to produce a sad frown, the mouth corners are drawn back and somewhat squared (oblong mouth), and the whole face flushes. Lowen (cited by Schutz, 1969) noted how two conflicting expressions were shown by one face. The eyes appear weak and withdrawn while the jaw is strong and protruding. It is Lowen's feeling that many expressions are related to the position of the jaw. As it moves forward, it first expresses determination, a further advance gives it a fighting expression. If these expressions are present then they must be studied, not only in children but in adults as well. Many of the nonverbal expressions are still present in adults but hidden and repressed to a much greater extent.





That facial expressions communicate the emotion of the individual, has been demonstrated by Tomkins (1963). He dealt with affect as it relates to facial responses. He conceived affects as primarily facial responses. He distinguished eight affects, three positive and five negative. The positive affects were: first, interest or excitement; with eyebrows down, stare fixed, or tracking an object, with a broad smile. Second, enjoyment or joy; the smiling response. Third, surprise or startle; with eyebrows raised and eyeblink and broad smile. There are five negative affects recognized by Tomkins: first, distress or anguish; mouth corners drawn back and squared, the crying response. Second, fear or terror; with eyes frozen open in a fixed stare or moving away from the dreaded object to the side, and with skin pale, cold, sweating, with lips trembling and hair erect. Third, shame or humiliation; with eyes and head lowered and neutral mouth expression. Fourth, contempt or disgust; with the upper lips raised in a sneer. Fifth, anger or rage; with a frown (depression of lips), clenched jaw and red face. Studying these affects, Tomkins (1963) came to the conclusion that affects were activated by stimulation. He posited that negative affects were activated by a continuing level of stimulation whereas positive affects were activated by stimulation decrease.

Research by Mehrabian and Ferris (1967) supported the contention that the facial channel was important. They investigated the decoding of inconsistent and consistent communication of attitude in facial and vocal channels, using three degrees of attitude (i. e. positive, neutral, and negative). The facial communications of three degrees of attitude were selected in a similar manner. Photographs of three female models were taken as they attempted to use facial expressions to communicate like,



neutrality, and dislike towards another person. It was found that attitudes were deduced from combined facial-vocal communication in each component, with the facial component receiving approximately 3/2 the weight received by the vocal component.

Up to this point the research reported has been favorable in using the mouth as an indicator of emotional feeling. However, there are some experiments which have questioned the ability of people to define the emotion by facial expressions which involve the mouth only.

Landis (1929) attempted to study emotional states by facial expression. When he submitted his photographs to forty-two students of psychology, Landis found that interpretations were no more correct than would be expected by chance. He concluded, therefore, that "it is practically impossible to name accurately the 'emotion' being experienced by a subject when one has only a photograph of the face on which to base the judgment (p. 70.)"

The results of studies with posed photographs, articulated models of the face, and unposed expressions aroused in the laboratory, have often led to the conclusion that a knowledge of the precipitating circumstances is essential to accurate judgment of emotion. Sherman (1927) found that observers who were not aware of the stimulating conditions showed much disagreement in characterizing the emotional reactions of young infants. When they saw, for example, the facial and general bodily expressions, observers designated the emotion most frequently as "anger." The next most frequent response was "hunger." When the mode of stimulation became apparent however, practically all of the observers agreed that the response was one of "fear."



Munn (1940) attempted to ascertain the influence of a knowledge of the situation upon judgment of emotion from facial expression. Since the situation could not be presented without involving posture, the results were considered in terms of both factors. There was a higher incidence of agreement for interpretations based upon the posture and situation than for those based upon the face alone. Clearly apparent in both sets of data is the marked ability of observers to discern the affective tone of a given expression in terms of the face alone. The expressions judged by the majority to be joy or happiness were interpreted by no observers as representing emotions which might be classified as unpleasant. In terms of face alone, there was no incidence of an expression predominantly judged as among unpleasant emotions being interpreted as joy or happiness. On this basis, Munn's (1940) results indicate that some spontaneous expressions are very accurately interpreted. On the other hand, some expressions were judged to represent one emotion when the face alone was observed, (e.g. sorrow), and to represent an entirely unrelated emotion when posture and situation became apparent, (e.g. determination).

It must be noted that the same general attitude can be present in very different emotions, because almost all emotional denominations include also situational reference and inner, not acted-out components. Therefore, interpretation in terms of emotions will show high variability. Moreover, emotions that contain the same general attitude will have identical expressions; therefore, they will be confused by the observer. These inferences are completely in harmony with the grouping results of Woodworth (1955), the analysis of Schlosberg (1954) and the experimental results of





Cline (1956) and Vinacke (1949).

Combining the foregoing, it may be stated as a general conclusion that facial expression represents only a general pattern: a general behavioral attitude, containing the state of attention and withdrawal of a person, as well as with another, the degree and state of his activity, and the degree to which he is involved in his own reaction. After examining the foregoing research it seemed necessary to include in the investigation another variable which was a part of facial expression. The most readily observable variable in the facial area other than eye contact was the mouth.

#### Physical Contact

Some studies have been attempted which purport to identify physical contact as a measure of the kind of interaction people are experiencing. Hall (1963) feels that there are basically four ways of relating by physical contact. These are a function of four basic inventories of potential actions: first, touching with the head or trunk, second, touching with forearms, elbows, or knees; third, touching with the arms fully extended; and fourth, with the arm and leg extended and body leaning back, i. e. stretching (far apart but still touching). Each increment symbolized a progressively greater distance and aloofness. Hall (1963) notes that greater physical contact indicates a warmer and better relationship with another in interaction.

Physical contact, as a communicative system, has also received systematic treatment by Frank (1957) and Jourard (1966). Jourard (1966) designed a questionnaire on which subjects indicated which of twenty-four body parts they had touched, or which had been touched by four target persons: mother, father, same-sexed friend and opposite-sexed friend, within the past twelve



months. He found students were touched most by their mothers and by friends of the opposite sex. It would seem that touching can take two forms of indicating attitude: positive and negative. It is felt by the author that forms of touching which indicate a positive attitude in a relationship, especially between a mother and child, would be such things as prolonged holding of the other, caressing. Negative forms of physical contact would consist of striking the other, pushing the other away, and other forms of interfering movements such as holding the other to prevent an action, and pulling the other back into a certain position. This seems to be supported by Mehrabian (1969) when he suggested that touching can communicate feeling. Mehrabian (1969) goes on to say, "physical contact can express a person's positive and negative attitude, both at the moment and in general (p. 54)."

Physical contact was utilized both by Hore (1968) and Acheson (1969) in their studies. Hore (1968) found that there was greater physical contact by the low SES pairs than by the high SES pairs. Hore (1968) however, did not distinguish between positive and negative forms of physical contact. Acheson (1969) used physical contact as one measure of maternal interference. He found that maternal interference was negatively related to response latency, but positively related to errors. Acheson's (1969) investigation implies that maternal interference as measured by physical contact is not desirable in terms of the best possible adjustment of the child nor the best learning style of the child.

Although there is a definite dearth of research in the area of physical contact, it appears that physical contact may serve as an indicator of the type of relationship taking place. As has been pointed out,



there is a need for the investigation of this area of nonverbal behavior as to what, if anything, physical contact communicates. Re-stated, what do positive and negative physical contact indicate about the mother-child relationship and do these nonverbal modes of behavior relate to the facilitation or inhibition of a child's cognitive growth?

### Posture

Research studies concerned with nonverbal communication have pointed out other important nonverbal cues. Posture, as one of these, has been considered as a compelling indicator of relationships. It seems from the research literature that body movement and distance are all special measures of posture.

### Body Movement

Body movement may be considered as a special form of posture. Knapp (1960) assumed that body movements can, to some extent, express something of what happens inside a person, call it mood, emotion, degree of tension. Body movements may be viewed as instrumental acts of communication in the same sense that words are, but transmitted via a different channel. Using an electromyograph, Sainesburg (1955) recorded high-amplitude muscle potentials accompanying movements. He found significantly more movements occurred during stressful periods of interviews. This was confirmed by Jourard (1966). This also confirms Krout's (1953) results that body movements may also be idiosyncratic expressions of specific conflict. Dittman (1962) counted the frequency of movements in three body areas for one patient in each of five different moods. He found that moods were differentiated by frequency of movements, and also that different body areas were active for different moods. During the patient's angry mood,





for example, there are many head and leg movements, but few hand movements, while during the depressed mood, there are few movements of the hands and head, but many leg movements. Also found were patterns of movements in the three body areas that varied tremendously from one person to another. For some people one or another area did not lend itself to frequency counts at all.

In a more recent study Dittman, Parloff, and Boomer (1965) studied the utilization of visual cues in inferring mood by a group of psychotherapists and a group of professional dancers. Members of these groups rated the pleasantness of affect shown by a patient in silent film segments. Segments showed either the whole body or the body with face masked. Both groups of judges could make differentiated judgments on the basis of body movement information. The groups differed in that the therapists tended to rely more heavily on the facial cues, while the dancers were more responsive to the rest of the body.

Ekman and Frieson (1968) found that reliable agreements can be made among observers of body motion. They report that rates of occurrence of specific body acts can differentiate among patients and within patients at different stages of treatment. Also, they say that body motion provides "information about affect, the on-going interpersonal relationship," and that there are "complex interrelationships between nonverbal behavior (body motion) and content or noncontent aspects of speech (p. 213)."

Mehrabian (1969) found that gross changes in body position, such as shifting in the chair, may show negative feelings toward the person one is talking to. He states that facial expressions, touching, gestures, self-manipulation (such as scratching), changes in body position, and head movements all can express a person's positive and negative attitudes. Movements of



the limbs, for example, not only indicate one's attitude toward a specific set of circumstances but relate to how dominant, and how anxious, one generally tends to be in social situations. Hatfield, Ferguson, and Alpert (1967) have developed some scales intended to tap the affective quality of the relationship between the child and his mother, namely warmth and hostility, measures of tension (as indicated, for example, by postural cues and facial grimaces) and general activity level.

It may be expected that conflict takes place in a highly authoritarian relationship more than in a democratic relationship. With conflict, forms of escape or defense appear. These may take the form of certain body positions or extreme body movements. Brannigan and Humphries (1969) illustrate this when they discuss the defensive beating posture which is characterized by the hand being placed to one side of the head but remaining still. The posture may be held for several seconds, after which, if the opponent does not give way, a blow may be delivered or the escape elements appear. Many of the expressive elements which are shown by young children can be seen in adults too. Although the beating posture is rarely seen in individuals over six years old, its disappearance is apparent, not real. Careful observations show that it becomes transformed into disguised forms. One form involves the thumb and adjacent finger touching the chin or cheek, with the palm of the hand facing the verbal opponent. Lowen (cited in Schutz, 1969) noted how retracted shoulders represent repressed anger, a holding back of the impulse to strike, raised shoulders are related to fear; square shoulders express the manly attitude of shouldering one's responsibilities. Other forms of expressive body positions which are very subtle and may be unconsciously motivated could be present.



It is up to researchers to search for and identify such variables.

Literature concerning maternal control indicates that there is much more tension and conflict in an authoritarian relationship (Hess and Shipman, 1967). The effect upon the child appears to be dependent upon how the organization inherent in communication is connected to control implemented by the mother over her child. For conceptualization, this can be viewed in terms of the modes of communication between the mother and child.

External body positions and movements may be indicators of the kind of relationship, thus making them important to study when considering a mother-child interaction.

#### Distance

Although research has emphasized the importance of social distance in group dynamics (Kurt Lewin, in G. Lewin, 1948, p. 20), the method of inquiry has not adequately investigated what distance indicates between a mother and child. The emphasis of this research has been on social distance in groups, at the expense of ignoring what distance communicates in an interaction of mother and child. Various researchers (Lewin, 1948; Sommer, 1959; Hill, 1963) have maintained that within a social situation distance is an important measure of interaction. Argyle and Dean (1965) found that when subjects were placed only two feet from one another, they looked into the other's line of regard much less than when they were six to ten feet apart. They proposed, as does Hall (1963), that both closer distances and increased amounts of looking at the other mark higher degrees of intimacy but also noted that there is an equilibrium point at which closer distances become anxiety provoking. Willis (1966) found significant variations in distance as a function of the relationship between the





interactants, their sex, age and race. These studies were written about people in a social setting, however, and so may not be directly relevant to the discussion of the mother-child relationship. But, as distance has received little consideration by child development researchers (Robson, 1967) results from associated research suggest that distance demonstrates a negative relationship with the other. Mehrabian (1969) notes that distance can show a negative attitude toward the message itself, as well as toward the act of delivering it.

Distance has been measured more accurately using inclination or the manner of orientation of the interactors. Studies by Spiegel (summarized in Machotka, 1965); Friedman (1967) and Scheflen (1964) suggest that body inclination can be a measure of the kind of relationship. Hall (1963) classified orientation by angle, ranging from face-to-face to back-to-back and noted that positions from face-to-face are used for various kinds of interactions. In Hall's (1963) experiment, the indicators of a warm relationship were definite body lean with head up and looking at the other. A rigid upright body, eyes and head lowered, a frown, were used as indicators of a negative relationship. Mehrabian (1968) found that orientation of body and relaxation of body (as measured by the seated communicator's reclining angle or backward lean and by his sideways lean) are significant indicators of the subject's liking for the addressee. Body relaxation, reclining angle or degree of backward lean of torso decreases for liked addressees, thus corroborating the findings of Reece and Whitman (1962) who used quite different methods, but found that greater forward lean was an indicator of liking. Over the entire range of attitudes (intense dislike, moderate dislike, neutral, moderate like and intense like),



the findings of the study by Mehrabian (1968) suggest that various indexes of orientation of a seated communication toward his addressee can be summarized in terms of shoulder orientation alone.

In a more recent study, Mehrabian (1969) noted that posture could be used to indicate both liking and status. He goes on to say, "the more a person leans toward his addressee, the more positively he feels about him (p. 54)." In explaining body inclination, Mehrabian (1969) established three categories to illustrate relaxation in a seated position: least relaxation is indicated by muscular tension in the hands, arms crossed for women, and rigidity of posture; moderate relaxation is indicated by a forward inclination of about twenty degrees, a curved back, and for women, an open arm position; and extreme relaxation is indicated by a reclining angle greater than twenty degrees and a sideways lean greater than ten degrees. The findings relating to sideways lean and shoulder orientation suggest a consistent pattern of differences for the nonverbal behaviors of male and female communicators vis-a-vis male addressees who are disliked intensely. Relative to females, male communicators exhibit less body relaxation (as indicated by less sideways lean) and a greater degree of vigilance (as indicated by a more direct shoulder orientation and a similar trend approaching significance for eye contact) toward intensely disliked males.

In considering the preceding comments it appears that body inclination and distance would be excellent measures of the type of relationship existing between a mother and child because of the intimacy of the relationship. To the extent that a power struggle exists between a mother and child (Hess and Shipman, 1965) most nonverbal gestures expressing positive or warm



emotions are not expected to be present.

This would bring the negative emotions such as distance and rigid body position to the fore as indicators of the "high control" of the mother which may in turn result in the depression of participation and of cognitive growth of the child.

### Mother-Child Interaction

It has been argued that as part of the home environment, the mother-child interaction is an integral part of the development of personality of the child (Kagan, 1964; Levin and Fleischmann, 1968; Schaeffer, 1959). According to Hess and Shipman (1967), the kind of family control and regulation used will manifest itself in the communication system between mother and child and this interaction has decisive consequences for the child's cognitive development.

Maternal behavior toward the preschool child, which includes emphasis on verbal interaction, has been shown to be related to the cognitive development of the child (Moss and Kagan, 1958). Hess and Shipman (1965) have argued that the child's style of response to problem-solving situations can be associated with the mother's ability to utilize verbal concepts in her interaction with him. Similarly, it was maintained by Bernstein (1964) that if the mother is constrictive in her verbal interaction with the child, the child seems to lack in ability to reflect, to consider and choose alternatives for speech and action. In a more comprehensive study Milner (1951) found that upon school entrance the lower class child seems to lack two advantages enjoyed by the middle-class child. The first advantage is described as a "warm adult-child relationship which is more and more being recognized as a motivational prerequisite of any kind of adult-controlled learning (p. 97)." The second advantage is an extensive





opportunity to interact verbally with adults in the family. Schaeffer (1959) points out that since the most extensive and intensive social interactions of the child during crucial developmental stages occur within the family and especially with the mother, the mother-child relationship would be of major importance in personality development. This is supported by Bettelheim (1952) and Bronfenbrenner (1953). Thus, there seems to be little doubt that verbal interaction is related to personality.

There is a lack of experimental and other studies in the area of relating nonverbal communication to maternal control, personality, and to the cognitive behavior of the child. In one of the few studies relating these factors, Brady (1969) found that nonverbal communication between mother and child was related to the child's learning style. He found that maternal attitude defined warmth in the mother-child relationship as reflected by their visual experience. Hore (1968) observed social class differences in nonverbal behavior. Hore (1968) implied that nonverbal communication was the result of affective components of the mother's personality and of differential child-rearing practices. It seems apparent from Brady's (1969) and Hore's (1968) studies that nonverbal behavior can serve as an indicator of facilitation and inhibition of the child's cognitive behavior. It would appear that children who are subjected to an excessive amount of maternal control have a tendency to avoid interaction both verbally and nonverbally, with the mother, which results in a depression of cognitive development.

In summary, research into the cognitive behavior of children has reflected study of the effects of parents and home environments. These studies, however, have stressed the verbal communication of the mother-



child interaction leaving the nonverbal mode relatively unstudied. The research literature suggests that "high control" by the mother results in the depression of cognitive and emotional growth. "Low control," where the child is offered and permitted an equal opportunity to express himself while interacting with his mother, enhances cognitive growth. Although the best view of communication may include both verbal and nonverbal aspects of an exchange, an understanding of the nonverbal mode of communication may give a greater understanding of the personalities involved in a mother-child interaction and in turn of how this relates to the cognitive behavior of the child.



# CHAPTER III

## DEFINITIONS AND HYPOTHESES

### I DEFINITIONS

For the purpose of this investigation the terms used are presented below with the following definitions.

Nonverbal Communication consists of all other communication but verbal.

It is comprised of such factors as posture, gesture, facial expression, voice inflection, the sequence rhythm, and cadence of the words themselves, and any other nonverbal manifestation of which the organism is capable, as well as the communicational clues unfailingly present in any context in which an interaction takes place. For the purpose of this investigation only the variables which follow will be used to comprise nonverbal communication.

Positive Nonverbal Communication (PNVC) - PNVC was measured by variables which were further classified into mutual smiles, child to mother smiles, mother to child smiles, mutual body inclination or approach, positive physical contact by the child, positive physical contact by the mother, positive head nod by the mother and positive head nod by the child.

Positive Head Movement by Child (PHMC) - PHMC refers to any motion of the child's head in an up and down movement.

Positive Head Movement by Mother (PHMM) - PHMM refers to any motion of the mother's head in an up and down movement.

Mutual Body Inclination - refers to the physical proximity of the heads of the individuals in the dyad. This was based on Hore's (1968) Inclination Grid. (See Figure 1 P. 29.)





Positive Physical Contact Child (PPCC) - PPCC refers to any part of the child's body touching any part of the mother's demonstrating warmth as judged in context (see Figure II Page 29.)

Example of Child's Positive Physical Contact:

When the child places his arm or head on his mother's arm and keeps it there for a prolonged period of time.

Positive Physical Contact Mother (PPCM) - PPCM refers to any part of the mother's body touching any part of the child's demonstrating warmth as judged in context (see Figure III P. 30.)

Examples of Mother's Positive Physical Contact:

- i. When the mother places her hand on the child's hand and keeps it there for a prolonged period of time.
- ii. When the mother places her arm around the child and holds the child close to her.

Mutual Smiles (MS) - MS involved smiles by the mother and child at the same time (see Figure IV P. 30 )

Child-Mother Smiles (CMS) - CMS involved the child smiling towards the mother without the mother reciprocating the smile.

Mother-Child Smiles (MCS) - MCS involved the mother smiling towards the child without the child reciprocating the smile (see Figure V P. 32.)

Negative Nonverbal Communication (NNVC) - NNVC was measured in context by variables which were further classified into negative head movements by the child, negative head movements by the mother, negative physical contact by mother, negative physical contact by child, external glance by child, external glance by mother, elbow lean by mother, elbow lean by child, arms crossed by mother, and overt body movement by child.



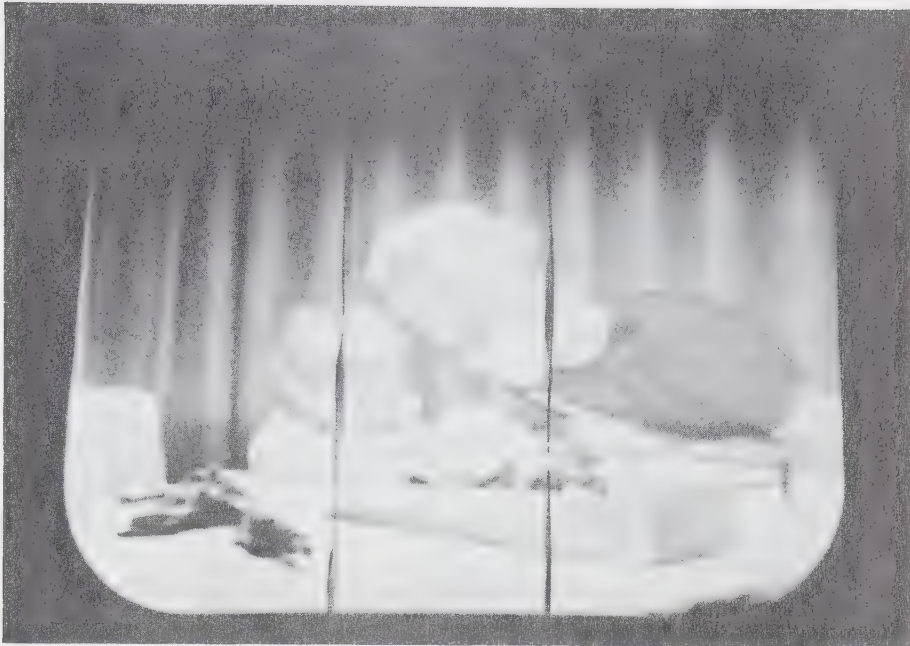


FIGURE I

Mutual Body Inclination



FIGURE II

Positive Physical Contact by Child





FIGURE III

Positive Physical Contact by Mother



FIGURE IV

Mutual Smile





Negative Head Movement Child (NHMC) - NHMC refers to any motion of the child's head in a side to side movement.

Negative Head Movement Mother (NHMM) - NHMM refers to any motion of the mother's head in a side to side movement.

Negative Physical Contact Mother (NPCM) - NPCM refers to any part of the mother's body touching any part of the child's so as to prevent a certain action and indicating a negative feeling as judged in context (see Figure VI P. 32)

Examples of Mother's Negative Physical Contact:

- i. When the mother pulls the child back into a sitting position.
- ii. When the mother pulls the child's hand away from the toys.

Negative Physical Contact Child (NPCC) - NPCC refers to any part of the child's body touching any part of the mother's indicating negative feeling as judged in context.

Examples of Child's Negative Physical Contact:

- i. When the child strikes his mother.
- ii. When the child pulls something from the mother's hand.

External Glance by Child (EGC) - EGC involved a glance by the child away from the task-oriented situation and also away from the mother (see Figure VII P. 33.)

External Glance by Mother (EGM) - EGM involved a glance by the mother away from the task-oriented situation and also away from the child (see Figure VIII P. 33.)

Elbow Lean by Mother (ELM) - ELM involved contact of the mother's hand or hands to any part of her head (see Figure IX P. 34.)

Elbow Lean by Child (ELC) - ELC involved contact of the child's hand or hands to any part of his or her head (see Figure IX P. 34.)





FIGURE V

Mother-Child Smiles



FIGURE VI

Negative Physical Contact Mother





FIGURE VII

External Glance by Child



FIGURE VIII

External Glance by Mother







FIGURE IX

Elbow Lean by Mother and Child



FIGURE X

Mother's Arms Crossed





FIGURE XI

Overt Body Movement by Child



Mother's Arms Crossed - involved any contact by the mother of one hand or arm with the other in front of her body (see Figure X P. 34).

Overt Body Movement by Child (OBMC) - OBMC involved any gross changes in the total body position by the child (see Figure XI P. 35)

Example of Overt Body Movement:

When the child moves from sitting close to the table to getting out of the chair completely.

Range of Nonverbal Behavior - range of nonverbal behavior refers to the total positive nonverbal behavior minus the total negative nonverbal behavior of the mother and child.

Total Positive Nonverbal Behavior - refers to the total positive nonverbal behavior by the child plus the total positive nonverbal behavior by the mother.

Total Negative Nonverbal Behavior - refers to the total negative nonverbal behavior by the child plus the total negative nonverbal behavior by the mother.

Total Nonverbal Behavior - refers to the total nonverbal behavior by the child plus the total nonverbal behavior by the mother.

## II HYPOTHESES

From the related literature the following hypotheses were formulated:

Hypothesis I: Total positive nonverbal behavior will be negatively correlated with maternal control.

Hypothesis II: Total negative nonverbal behavior will be positively correlated with maternal control.

Hypothesis III: Total range of nonverbal behavior will be negatively correlated with maternal control.





Hypothesis IV: Total nonverbal behavior will be negatively correlated with maternal control.

Hypothesis V: Total positive nonverbal behavior will be differentially correlated with the learning style and achievement of the child.

Hypothesis VI: Total negative nonverbal behavior will be differentially correlated with the learning style and achievement of the child.

Hypothesis VII: Total nonverbal behavior will be differentially correlated with the learning style and achievement of the child.

Hypothesis VIII: Total range of nonverbal behavior will be differentially correlated with the learning style and achievement of the child.

### III LIMITATIONS OF THE STUDY

- (1) The study was limited to the investigation of thirty-two middle socio-economic class mothers and their four-year-old children.
- (2) The study was limited to examining correlations between events and therefore does not attempt to demonstrate causal occurrences.
- (3) The study was limited to the researcher's definitions of positive and negative nonverbal behavior.
- (4) The study was limited to the nonverbal behaviors identified.



## CHAPTER IV

### METHODOLOGY

#### THE SAMPLE

Brady (1969) used the 1967 census data from the City of Edmonton to determine an area that was representative of middle socio-economic status (SES). The researcher solicited for the experiment thirty-two dyads. The following data, indicates the representativeness of the sample, as set out by Brady (1969), according to additional standards (Hore, 1968; Blishen, 1958).

TABLE I  
DESCRIPTIVE SOCIO-ECONOMIC DATA

SES	Mean: 54
(Blishen Index)	Range: 43 to 75
Combined Average Number of Years Education for Mother and Father	Mean: 11.5 Range: 8 to 18
Combined Income of Mother and Father	Under \$5,000 per annum N 2  Between \$5,000 and \$10,000 N 21 per annum  Over \$10,000 N 7 per annum



Brady (1969) summarized the data as follows:

Socio-economic data indicated the sample was upper-middle class. Hore's (1968) sample of high SES and low SES had average Blishen Indexes of 71.15 and 45.94 respectively. This sample had an average Blishen Index of 54 which fell between Hore's samples. The other two indexes of socio-economic status positioned themselves similarly in relation to Hore's sample (1968, p. 25 - 26). The number of people earning over \$10,000 per annum and the mean Blishen Index of 54 for the present sample indicated that the socio-economic status was upper-middle class (p. 37).

All of the children used in the research were of normal intelligence. The ages of the children ranged from four years to four years eleven months. None of the seventeen boys nor the fifteen girls had kindergarten experience. To insure that none of the children taking part in the study were of below average intellectual ability, the Van Alstyne Picture Vocabulary Test was used. The Van Alstyne Picture Vocabulary Test has a correlation of 0.71 with the Stanford Binet for this age level. In a similar manner, the vocabulary section of the Wechsler Adult Intelligence Scale was used to insure that no mothers were below average in verbal ability. The noted conditions were met by all subjects.

#### EXPERIMENTAL PROCEDURE

The personnel of the Audio-Visual Media Department of the University of Alberta, under the direction of Brady (1969), made videotape recordings of the thirty-two mother-child dyads interacting in a structured situation. (Only thirty of the mother-child dyads were analysed because of videotaping difficulties). The mother and her child were first allowed to play for a period of time with a number of toys that were present on the table.





Following the play period the mother was to teach her child how to separate blocks on the basis of color, shape and size, respectively. When the three block separation tasks were completed the mother and child were shown three Children Apperception Test cards. They were requested to make up a story about each of these cards. When they completed the story telling period, they were taken to cubicles where the mother answered the PARI and a small questionnaire regarding socio-economic background and the child was administered a test of his learning style.

#### SELECTION OF NONVERBAL VARIABLES

The nonverbal variables chosen for the study were based on two criteria. First, a review of the related literature revealed certain outstanding nonverbal behaviors which were easily identified and had been studied extensively in other research. Second, when reviewing the preliminary tapes, certain nonverbal behaviors appeared in every tape. It seemed imperative to the author that these variables be studied in more detail.

The nonverbal variables were divided into positive nonverbal variables and negative nonverbal variables as defined. The variables were divided into the two spheres so as to identify positive affect which might facilitate cognitive growth and negative affect which might inhibit cognitive growth.

Following are the nonverbal behaviors studied:



TABLE II

NONVERBAL VARIABLES

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Positive Nonverbal Behaviors	Negative Nonverbal Behaviors
<hr/>	<hr/>
1. M-C Smiles	Elbow Lean by Child
2. C-M Smiles	Elbow Lean by Mother
3. Mutual Smiles	Arms Crossed by Mother
4. Positive Head Movement Mother	Negative Head Movement Mother
5. Positive Head Movement Child	Negative Head Movement Child
6. Positive M-C Touch	Negative M-C Touch
7. Positive C-M Touch	Negative C-M Touch
8. Mutual Body Inclination	Overt Body Movement by Child
9.	External Glance by Mother
10.	External Glance by Child

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#### MEASUREMENT OF NONVERBAL VARIABLES

During the mother-child interaction, the author counted the total number of times the mother and child interacted or portrayed each nonverbal variable as defined. The experimenter concentrated primarily on one individual at a time except for the mutual variables. In order to facilitate counting the audio was removed. Several video-tape playbacks were necessary to collect and analyze all the nonverbal variables. An interaction timer and counter developed and used at the University of Alberta by Hore (1968) facilitated analysis of nonverbal behaviors. The reliability of the experimenter's judgment as to each nonverbal variable was found by the use of an independent judge (see p. 49).

#### MEASUREMENT OF MATERNAL CONTROL

The test of Maternal Control was the Parent Attitude Research Instrument (PARI) developed by Schaeffer and Bell (1958). The test is a bidimensional attitude scale describing maternal social-emotional behavior on the dimensions of autonomy-control and love-hostility. One hundred and fifteen of the most reliable items (internal consistency ranged from .34 to .77, Brady, p. 41) were chosen. The items were then arranged into twenty-three subscales. The first factor named "Approval or Maternal control of the child" was loaded with sixteen of the subscales.

#### MEASUREMENT OF LEARNING STYLE

The test of learning style consisted of twenty test cards. On each card that the child was shown there was a standard picture, below which were several designs only one of which was identical with the standard.





The measure of reflectiveness involved the time taken to make the initial selection and the number of errors made.

#### MEASUREMENT OF OBJECTIVE AND SUBJECTIVE SORT

The test of "objective sort" (OS) consisted of the child's ability to classify twelve of the Vygotsky blocks according to color, shape and size. The number of blocks correctly placed by color, shape and size was OS.

The test of "subjective sort" (SS) consisted of the child's ability to verbalize his reasons for making the sort the way he did. The child's verbalizations were rated on a concrete to abstract continuum. Both OS and SS were considered measures of cognitive achievement.

#### STATISTICAL ANALYSIS

Reliability was computed using Spearman's Coefficient of Rank Correlation. The hypotheses were tested by Pearson-Product Moment Correlations. Alpha levels of .10, .05, and .01 were utilized to determine the statistical significance of the correlations. A one-tailed test was utilized due to the directionality of the hypotheses.



# CHAPTER V

## RESULTS

### Reliability

Inter-rater reliability for the nonverbal measures were calculated using Spearman's Coefficient of Rank Correlation. Five randomly selected videotapes were used as a basis for determining the inter-rater reliability. The obtained coefficients are presented in Table III.

TABLE III  
RELIABILITY FOR THE NUMBER AND DURATION OF  
NONVERBAL VARIABLES

	<u>Number</u>	<u>Duration</u>
M-C Smiles	0.975	1.000
C-M Smiles	1.000	1.000
Mutual Smiles	1.000	1.000
Elbow Lean by Child	1.000	1.000
Overt Body Movement Child	0.850	0.995
Arms Crossed Mother	0.600	0.900
Elbow Lean Mother	0.925	1.000
Mutual Body Inclination	1.000	1.000
Positive Head Movement Mother	0.984	0.925
Negative Head Movement Mother	0.875	0.750
Positive Head Movement Child	0.825	1.000
Negative Head Movement Child	0.725	0.975
M-C Touch Positive	0.900	0.975
M-C Touch Negative	0.975	0.975
C-M Touch Positive	0.700	0.975
C-M Touch Negative	1.000	1.000
External Glance Mother	0.975	0.975
External Glance Child	0.825	0.725



The obtained coefficients demonstrate that high inter-rater reliability was obtained. It may be noted that for the frequency of the variables, a correlation of 1.000 was obtained for five variables; a correlation of .900 to .999 was obtained for six variables; a correlation of .800 to .899 was obtained for four variables; a correlation of .700 to .799 was obtained for two variables. For only one variable the correlation was below .700 for the inter-rater reliability, namely .600.

The obtained coefficients for Duration in Table III also demonstrated high inter-rater reliability. There were eight variables with 1.000 correlation, eight variables with correlations between .900 and .999, and two variables with correlations between .700 and .799.

### Hypotheses

Hypothesis I. Total positive nonverbal behavior will be negatively correlated with maternal control.

TABLE IV  
CORRELATIONS BETWEEN MATERNAL CONTROL AND NUMBER AND DURATION  
OF TOTAL POSITIVE NONVERBAL BEHAVIORS

	Total Positive Nonverbal Behavior (N= 30)
Number	-0.615***
Duration	-0.446***

\*\*\* Significant at .01 level





The correlation between maternal control and the number of total positive nonverbal variables of communication (-0.615) was significant at the .01 level of confidence. The correlation between maternal control and the duration of total positive nonverbal variables (-0.446) was significant at the .01 level of significance.

Hypothesis II. Total negative nonverbal behavior will be positively correlated with maternal control (N =30).

The data failed to confirm this hypothesis when the correlation between maternal control and total negative nonverbal behavior was studied. The observed correlation was 0.005 which did not reach significance at the .10 level of confidence.

Hypothesis III. Total range of nonverbal behavior will be negatively correlated with maternal control (N =30).

The data confirmed this hypothesis and was significant at the .01 level. The analysis produced a Pearson-Product Moment Correlation of -0.472 and -0.489 respectively for the number and duration.

Hypothesis IV. Total nonverbal behavior will be negatively correlated with maternal control (N =30).

The correlation between maternal control and the number of total nonverbal behaviors measured (-0.590) was significant at the .01 level. The correlation between maternal control and duration of total nonverbal behavior measured (-0.319) was significant at the .05 level of significance. Hypothesis IV was upheld.

Hypothesis V. Total positive nonverbal behavior will be differentially correlated with the learning style and achievement of the child:



- (i) Response latency will be positively correlated with number and duration of total positive nonverbal behavior.
- (ii) Error will be negatively correlated with number and duration of total positive nonverbal behavior.
- (iii) Achievement will be positively correlated with number and duration of total positive nonverbal behavior.

TABLE V

CORRELATION OF RESPONSE LATENCY WITH NUMBER AND DURATION OF  
TOTAL POSITIVE NONVERBAL BEHAVIOR

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---

	Total positive nonverbal behavior (N = 30)
Number	0.261*
Duration	0.027

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\*Significant at the .10 level

Table V summarizes the data that pertains to Hypothesis IV (i). The correlation was supported at the .10 level of significance for the number of total positive nonverbal behavior correlated with response latency. Direction of the correlation was consistent with the prediction.



TABLE VI  
CORRELATION OF ERRORS WITH NUMBER AND DURATION OF TOTAL  
POSITIVE NONVERBAL BEHAVIOR

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	Total Positive Nonverbal Behavior (N =30)
Number	-0.258*
Duration	-0.298*

---

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\*Significant at the .10 level

The data testing Hypothesis V (ii) are presented in Table VI. Hypothesis V (ii) was confirmed at the .10 level of significance for both number and duration.

TABLE VII  
CORRELATION OF CHILD ACHIEVEMENT WITH NUMBER AND DURATION  
OF TOTAL POSITIVE NONVERBAL BEHAVIOR

---

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	Total Positive Nonverbal Behavior (N= 30)	
	<u>Number</u>	<u>Duration</u>
OS	0.169	0.215
SS	0.053	0.062

---

---





Table VII outlines the data for testing Hypothesis V (iii). The total positive nonverbal variables failed to support the predictions. All correlations went in the predicted direction. Using the Spearman-Brown Prediction Formula, it was found that an increase in the sample size would produce a correlation of 0.288 between the number of total positive nonverbal variables and OS, which would be significant at the .10 level.

Hypothesis VI. Total negative nonverbal behavior will be differentially correlated with the learning style and achievement of the child:

- (i) Response latency will be negatively correlated with number and duration of total negative nonverbal behavior.
- (ii) Error will be positively correlated with number and duration of total negative nonverbal behavior.
- (iii) Achievement will be negatively correlated with number and duration of total negative nonverbal behavior.

TABLE VIII

CORRELATION OF CHILD'S RESPONSE LATENCY AND NUMBER AND  
DURATION OF TOTAL NEGATIVE NONVERBAL BEHAVIOR

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	Total Negative Nonverbal Behavior (N =30)
Number	0.055
Duration	-0.009

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Table VIII outlines the data for testing Hypothesis VI (i).

The data were not consistent with the prediction.

TABLE IX  
CORRELATION OF ERRORS WITH NUMBER AND DURATION OF TOTAL NEG-  
ATIVE NONVERBAL BEHAVIOR

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	Total Negative Nonverbal Behavior (N =30)
Number	0.020
Duration	0.010

---

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The data summarized in Table IX failed to support Hypothesis VI (ii). The correlations were in the predicted direction.

TABLE X  
CORRELATION OF CHILD ACHIEVEMENT WITH NUMBER AND DURATION  
OF TOTAL NEGATIVE NONVERBAL VARIABLES

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	Total Negative Nonverbal Behavior (N =30)	
	<u>Number</u>	<u>Duration</u>
OS	-0.264*	-0.317**
SS	-0.022	-0.086

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---

\*\* Significant at the .05 level

\* Significant at the .10 level.



Table X outlines the data for testing Hypothesis VI (iii).

The prediction was supported only by the correlation of OS with number and duration of total negative nonverbal behavior at the .10 and .05 levels of significance, respectively.

Hypothesis VII. Total nonverbal behavior will be differentially correlated with learning style and achievement of the child:

- (i) Response latency will be positively correlated with number and duration of total nonverbal behavior.
- (ii) Error will be negatively correlated with number and duration of total nonverbal behavior.
- (iii) Achievement will be positively correlated with number and duration of total nonverbal behavior.

TABLE XI  
CORRELATION OF RESPONSE LATENCY WITH NUMBER AND DURATION OF  
TOTAL NONVERBAL BEHAVIOR

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	Total Nonverbal Behavior (N = 30)
Number	0.368**
Duration	0.180

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---

\*\* Significant at .05 level

The data testing Hypothesis VII (i) presented in Table XI supports the prediction in part at the .05 level of significance. The correlation





of response latency with duration of total nonverbal behavior was not significant, but the correlation was in the predicted direction.

TABLE XII  
CORRELATION OF ERRORS WITH NUMBER AND DURATION OF TOTAL  
NONVERBAL VARIABLES

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---

	Total Nonverbal Behavior (N =30)
Number	-0.189
Duration	-0.072

---

---

The correlation between error and total nonverbal behavior (Hypothesis VII (ii)) was not significant at the .10 level of confidence. The correlations were in the predicted direction.

TABLE XIII  
CORRELATION OF ACHIEVEMENT WITH NUMBER AND DURATION OF  
TOTAL NONVERBAL BEHAVIOR

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---

	Total Nonverbal Behavior (N =30)	
	<u>Number</u>	<u>Duration</u>
OS	0.194	0.134
SS	0.071	-0.184

---

---



Table XIII summarizes the data that pertain to Hypothesis VII (iii). The data failed to support the Hypothesis at the .10 level of confidence. The direction was consistent with the prediction except for the correlation of SS with duration of total nonverbal behavior, which was reversed.

Hypothesis VIII. Total range of nonverbal behavior will be differentially correlated with the learning style and achievement of the child:

- (i) Response latency will be positively correlated with number and duration of total range of nonverbal behavior.
- (ii) Error will be negatively correlated with number and duration of total range of nonverbal behavior.
- (iii) Achievement will be positively correlated with number and duration of total range of nonverbal behavior.

TABLE XIV

CORRELATION OF RESPONSE LATENCY WITH NUMBER AND DURATION OF  
TOTAL RANGE OF NONVERBAL BEHAVIOR

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	Total Range of Nonverbal Behavior (N =30)
Number	0.157
Duration	0.024

---

---



The data testing Hypothesis VIII (i) presented in Table XIV fails to support the hypothesis but is in the predicted direction.

TABLE XV  
CORRELATION OF ERRORS WITH NUMBER AND DURATION OF TOTAL  
RANGE OF NONVERBAL BEHAVIOR

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---

	Total Range of Nonverbal Behavior (N =30)
Number	-0.218
Duration	-0.159

---

---

The correlation failed to support Hypothesis VIII (ii) at the .10 level of significance. The correlations were in the predicted direction.

TABLE XVI  
CORRELATION OF ACHIEVEMENT WITH NUMBER AND DURATION OF TOTAL  
RANGE OF NONVERBAL BEHAVIOR

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---

	Total Range of Nonverbal Behavior (N =30)	
	<u>Number</u>	<u>Duration</u>
OS	0.316**	0.384**
SS	0.028	0.113

---

---

\*\* Significant at .05 level



The predictions for Hypothesis VIII (iii) were supported only by the correlation of OS with number and duration of total range of nonverbal behavior at the .05 level of significance. All correlations were in the predicted direction.





CHAPTER VI  
DISCUSSION AND IMPLICATIONS

DISCUSSION

On the basis of the information gathered in this study various trends appeared in the mother-child relationship. Mothers characterized by high control have a relationship with their children which was characterized by the paucity of non-verbal expression. Second, there was also indications that the non-verbal participation between mother and child was related to the cognitive behavior of the child in terms of what he learned and the style by which he learned.

The results can be explained in terms of Brady's (1969) model. Brady (1969) assumed that the basic element for a child's growth was participation in communication exchange with the maternal figure. Participation was dependent on the warmth (as reflected by the amount of visual interaction between the mother and child). In turn the child's verbal and nonverbal participation affected his learning which includes both process and product. Figure I is a sketch of Brady's (1969) model.

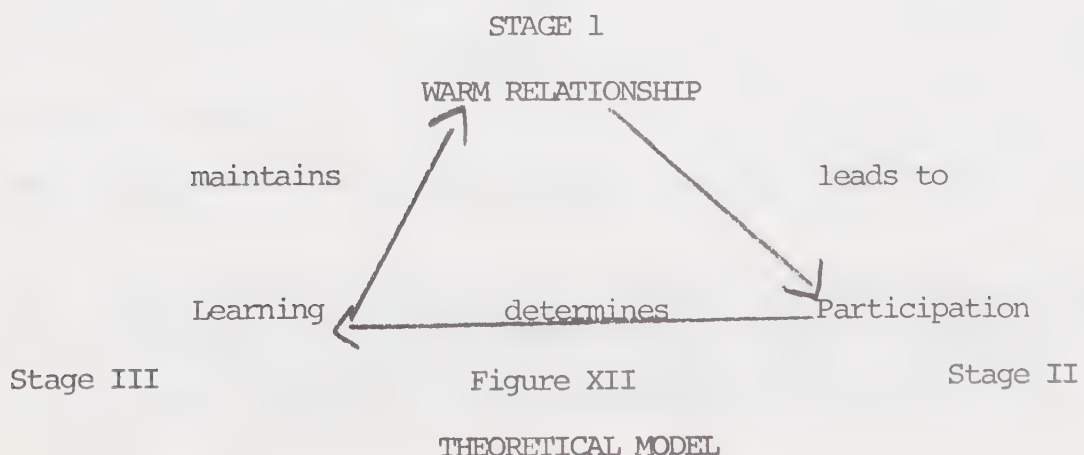




Figure XIII is a sketch of this study's results as interpreted within Brady's (1969) model.

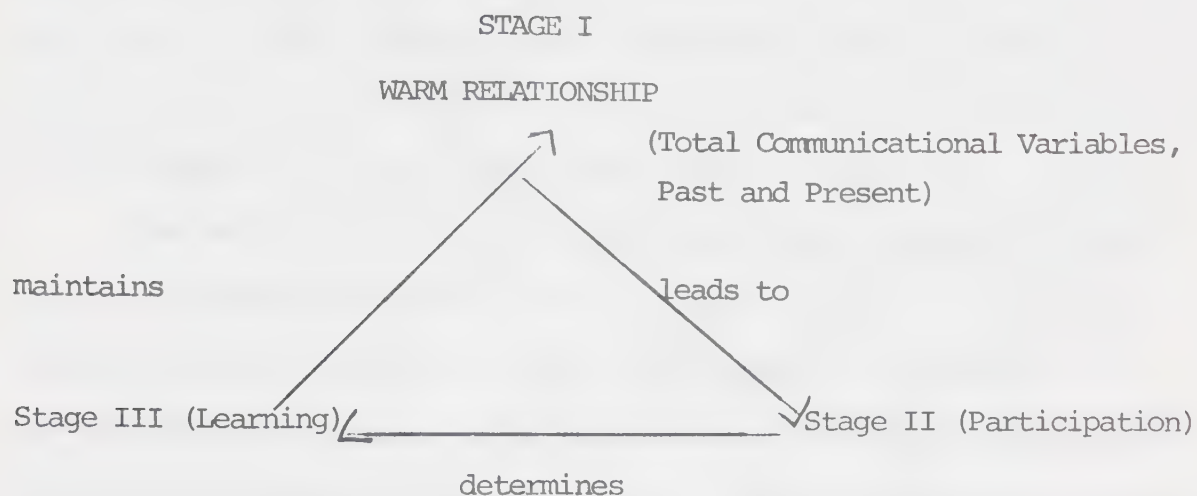


Figure XIII

#### TRANSFORMED MODEL

The findings demonstrated that controlling mothers did not engage in as much positive nonverbal interaction with their children (Hypothesis I, Table IV). A plausible explanation can be given for the occurrence of this phenomenon. In terms of Exline et al., (1965) this was interpreted as a lack of warmth in the mother-child relationship. Schaeffer (1959) explained maternal behavior in terms of two bipolar dimensions which were labeled Autonomy vs Control and Love vs Hostility. Using Schaeffer's (1959) model, controlling mothers who failed to interact with their children would be mothers who would be ignoring, punitive, perceiving the child as a burden, strict,

1. When total is used with the nonverbal variables, this means that it includes both mother and child nonverbal behavior. Eg. Total positive nonverbal behavior means a cumulative total of positive nonverbal behavior by mother and child.



and would use fear to control their children. Parental rejection of the child, whether expressed subtly and indirectly or more overtly manifested through general negligence or even by direct punishment would seem to carry a common core of unpleasant affective experience for the child. In any event the controlling mother failed to appear to have established a warm relationship with her child.

The model indicated that a warm relationship should be followed by more nonverbal participation by the child and mother. The present investigation of the data confirmed this prediction. Hypothesis III (p. 46) demonstrated that controlling mothers had children who engaged in a smaller range of nonverbal behavior. As well, Hypothesis IV (p. 46) confirmed the prediction that maternal control would be negatively correlated with the total nonverbal behavior. These two hypotheses seem to indicate that controlling mothers prevent expressiveness in their children. It seems that expression of emotional affect may be necessary for assisting the child emotionally. This expression need not be only positive emotion but negative emotion as well. Hess and Shipman (1965) pointed out that mothers who use inhibitory procedures tend to cut off thought and to discourage the consideration of alternate ways of reacting as expressed in the mother-child communication. As well, if this emotion is not overtly released as communicational or otherwise, then what happens to it? It would seem possible that tension may be produced by holding emotion within. The failure to release emotion in a natural way may facilitate undesirable consequences for the child. This internal emotion or tension which is prevented from being expressed externally then must be held internally which, in turn, may inhibit learning. In any event, controlling mothers seems to inhibit participation between themselves and their children.





It has been hypothesized that in a mother-child interaction characterized by high maternal control there would be more negative nonverbal behavior (Hypothesis II, p. 46). The results of the present study, however, did not support such a conclusion. A plausible explanation may be given. Exline et al., (1965) for example, stated:

"Individuals whose composure is threatened by the nature of their interaction with another, may perhaps unconsciously signal a desire to maintain psychological distance (p. 208)."

If these signals have been established in the relationship, it may be that the signals are so subtle that further investigation is needed to identify them. However, it is also possible that maternal control has prevented the child from expressing himself either positively or negatively by nonverbal means or otherwise. This would mean that high maternal control might suppress positive and negative expression. The result of this would seem to be a submissive and impulsive child (Hess and Shipman, 1967).

Stage III of the model stated that the learning of the child was influenced by how he participated with his mother. It was predicted that learning style would be differentially correlated with the nonverbal variables. For instance, it was expected that the response latency would be positively correlated with positive, total and range of nonverbal variables (Hypotheses V(i), VII (i) and VIII (i), respectively), while negative nonverbal variables would be inversely correlated (Hypothesis VI (i)). Range and negative nonverbal variables failed to reach an acceptable level of predicted expectation. It is difficult to understand the reason for some of the hypotheses to be supported while others were inconsistent with predictions. However, a plausible explanation may be



that response latency is primarily an affective aspect of learning and total and positive nonverbal variables also are solely affective variables. Negative and range of nonverbal variables may include some cognitive element such as "limit setting". Birdwhistell (1963) pointed out how communication included both the interaction but also the rules for the regulation of this relationship. This would seem particularly relevant to negative nonverbal variables as they may define the limits within which the child operates in a certain situation and therefore carry a specific cognitive meaning. Assuming that response latency is primarily an affective aspect of learning and negative nonverbal communication has cognitive elements, this might account for this hypothesis failing to be upheld. More support for this interpretation was found upon examination of other hypotheses. Range also might be expected to have some cognitive elements in that range was determined by subtracting negative from positive nonverbal variables. Therefore, since range to some extent is connected with negative and positive nonverbal variables, it might be expected that range has both affective and cognitive elements. The relationship of range to response latency was in the predicted direction but failed to reach the acceptable level of statistical acceptance (Hypothesis VIII(i), Table XIV, p. 53). If range carries cognitive elements and response latency is primarily affective this might account for the failure to reach the acceptable level of confidence while at the same time going in the predicted direction.

The other dimension of learning style, error, was expected to be negatively related to positive, total and range (Hypotheses V(ii); VII (ii) and VIII (ii), respectively) and positively related to negative nonverbal variables (Hypothesis VI (ii)). However, positive nonverbal behavior



was the only variable that was significantly related (Hypothesis V (ii), Table VI, p. 48). Total and range were in the predicted direction but failed to reach significance while negative nonverbal behavior was statistically not significant. This finding is hard to account for if there is any validity regarding the affective-cognitive explanation given for response latency and nonverbal variables. Brady (1969) assumed error to have a cognitive element. This being the case, negative nonverbal variables would be anticipated to be more significantly related to error while positive, total and range, being more affective nonverbal variables, would not be related. However, this direction is reversed by present findings. Two plausible explanations can be given. First, error tends to be the least reliable aspect of learning style (Kagan, 1963) and therefore it might be expected that this dimension would yield inconsistent findings, (Campbell, 1968; Brady, 1969). Second, error may be more affective than Brady (1969) assumed, which would account for the present findings.

Achievement was anticipated to be positively correlated to positive, total and range of nonverbal variables (Hypotheses V (iii), VII (iii) and VIII (iii), respectively). Negative nonverbal variables were posited to be negatively correlated to achievement (Hypothesis VI (iii)). In terms of an underlying cognitive-affective dimension within the nonverbal variables and achievement it would be expected that achievement would be primarily cognitive, and therefore correlations between both negative nonverbal behavior and range of nonverbal variables and that of achievement would be higher. This was found (Hypothesis VI (iii), Table XI and Hypothesis VIII (iii), Table XVI). On the other hand, correlations of positive and total with achievement were not significant though in the





predicted direction. This suggests to the author that achievement may in fact be more dependent on nonverbal variables which carry cognitive meaning, (i.e. negative and range), in terms of limit setting, but not be as affected by pure affective expression (total and positive) in the mother-child relationship. It may be that achievement to some extent is dependent upon getting the child to comply or conform to demands of the setting as defined in the communicational exchange between mother and child. The conformity demands may primarily be reflected in the negative non-verbal behaviors and in the range of nonverbal expressions.

Summing up, the hypotheses for this study were mainly supported. This study adds credence to prior research in the area of nonverbal behavior by Hore (1968) and Brady (1969). It would appear from studying these results that nonverbal expression is necessary for the children to develop cognitively. This investigation, then, does not imply that a mother should not control her child. A child needs the security of having certain aspects of his behavior closely defined and limited in the interest of personal welfare during the time he is in the process of learning (Bruner, 1966). Adequate amounts of positive and negative affect seem necessary to facilitate cognitive development of the child.

## IMPLICATIONS

### Use in Schools

The findings of the thesis seem to imply that controlling a child's expressiveness hinders his cognitive development. This investigation does not imply that a teacher should not control certain behaviors. A child needs limits so as to define which behaviors are acceptable and which are not. It does suggest, however that giving expression to negative affect as well as positive affect is a necessary and desirable part of the behavior





of the child. The environmental atmosphere should facilitate expressiveness in a child. Allen (1957) emphasized its importance to learning. Classroom study should look at atmosphere via positive and negative interaction between teacher-pupil and pupil. Facilitation of both types of affect may help produce healthier, more creative and exploratory children instead of passive, cooperative, but very impulsive individuals. These factors may help children enjoy the educational environment.

### Child-Rearing

The importance of allowing the child to express himself by non-verbal means in communicational exchanges should be "pointed out" to mothers. Both positive and negative forms of nonverbal behavior should be allowed and encouraged in children. It should be pointed out that expressiveness using both positive and negative affect by both mother and child might improve the relationship. However, caution should be given to mothers who might use much more negative affect than positive. Adequate amounts of both should help develop a responsive, creative child. Expressiveness might create a better atmosphere for release of energy that children have at this age. Furthermore, expressive behaviors by the child might lessen the difficulties that adults have in expressing themselves instead of following cultural demands and "holding it within oneself."

### Other Possibilities for Research

Research comparing personality outcomes with a poor mother-child nonverbal relationship would provide useful information as to how the mother-child interaction affects definite personality structures in the child. Intense study of and identification of new nonverbal behaviors



which are much more subtle, but still very much a part of the communicational system, seems necessary.

Is it possible that an increase in nonverbal behavior could take place without an improvement in emotional health and improvement cognitively? What are some methods for facilitating the expression of affect in an individual? These are a few still unanswered questions which suggest that a great deal of research in this area is indeed possible.



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## APPENDIX A





RAW DATA

MATERNAL CONTROL<sup>1</sup>

Mother	Maternal Control Scores	Number of MG	Duration of MG
1	208	17	6
2	194	22	9
3	203	4	2
4	211	51	32
5	148	92	74
6	155	39	38
7	153	37	24
8	131	32	15
9	225	14	5
10	116	29	19
11	162		
12	205	12	6
13	201	39	14
14	183	4	3
15	212		
16	207	31	19
17	164	22	16
18	156	69	41
19	251		
20	151	8	4
21	128	24	11
22	166	31	11
23	167	5	3
24	230	28	13
25	143	41	29
26	161	21	14
27	203	12	6
28	195	11	5
29	206	33	9
30	213	58	4
31	185	11	2
32	209	37	13

<sup>1</sup>  
Brady, (1969)



## APPENDIX B



RAW DATA

LEARNING STYLE AND ACHIEVEMENT DATA OF CHILDREN<sup>1</sup>

	RL	E	OS	SS
1	59	17	36	5
2	78	17	36	4
3	76	24	27	0
4	71	15	36	6
5	119	16	36	7
6	107	11	36	1
7	107	11	30	5
8	73	14	29	0
9	70	17	30	4
10	66	6	36	4
11	159	3	36	6
12	48	17	36	5
13	71	28	36	2
14	42	16	30	0
15			32	2
16	64	15	28	0
17	130	3	15	0
18	217	13	27	1
19			0	0
20	113	11	36	7
21	114	9	26	4
22	232	12	29	1
23	101	12	29	1
24	42	20	24	1
25	45	26	36	0
26	48	19	23	0
27	72	14	36	8
28	62	14	36	0
29	71	21	26	3
30	42	39	12	1
31	81	16	36	2
32	63	11	12	5

<sup>1</sup>  
Brady, (1969)



RAW DATA

NONVERBAL BEHAVIOR

MOTHER	NUMBER	DURATION	NUMBER	DURATION	NUMBER	DURATION
	M-C	M-C	C-M	C-M	MUTUAL	MUTUAL
	SMILES	SMILES	SMILES	SMILES	SMILES	SMILES
1.	1	1	11	14	1	1
2.	17	15	25	23	9	15
3.	15	13	13	7	11	9
4.	26	14	17	16	9	5
5.	62	134	33	35	29	38
6.	14	34	8	16	8	33
7.	5	3	36	103	11	56
8.	10	17	35	54	21	56
9.	4	2	5	2	3	1
10.	29	32	19	40	52	216
11.	16	12	29	79	39	186
12.	2	2	13	19	4	8
13.	11	15	36	73	25	61
14.	24	83	17	22	25	77
15.						
16.	15	24	21	49	20	83
17.	24	20	31	81	26	94
18.	31	79	44	98	42	111
19.						
20.	37	77	14	31	26	117
21.	9	4	23	51	10	34
22.	15	27	29	35	13	17
23.	5	4	36	134	12	46
24.	15	57	30	62	35	117
25.	16	31	22	47	9	8
26.	8	7	14	32	9	15
27.	8	11	10	23	11	46
28.	11	9	18	26	14	31
29.	6	3	6	4	12	18
30.	22	87	23	36	19	32
31.	3	4	20	35	5	5
32.	20	26	4	2	4	12





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RAW DATA

MOTHER	MOTHER OF POSITIVE M-C TOUCH	DURATION POSITIVE M-C TOUCH	NUMBER OF NEGATIVE M-C TOUCH	DURATION NEGATIVE M-C TOUCH
1.	2	1	17	4
2.	3	1	3	1
3.	1	3	9	12
4.	7	16	15	11
5.	9	16	6	2
6.	10	300	6	12
7.	4	61	14	13
8.	10	17	4	1
9.	1	2	14	10
10.	6	5	2	1
11.	2	1	2	0
12.	4	31	11	8
13.	8	62	31	57
14.	0	0	4	1
15.				
16.	7	57	17	23
17.	0	0	2	0
18.	1	1	4	1
19.				
20.	8	9	1	0
21.	3	2	23	18
22.	3	7	21	28
23.	0	0	4	3
24.	7	4	5	1
25.	5	2	11	6
26.	2	2	5	4
27.	0	0	4	9
28.	4	4	5	1
29.	0	0	6	1
30.	2	1	2	1
31.	0	0	11	8
32.	6	30	41	54



## RAW DATA

MOTHER	NUMBER OF POSITIVE C-M TOUCH	DURATION POSITIVE C-M TOUCH	NUMBER OF NEGATIVE C-M TOUCH	DURATION NEGATIVE C-M TOUCH
1.	0	0	0	0
2.	4	2	0	0
3.	1	0	2	1
4.	8	27	8	5
5.	13	80	3	1
6.	1	9	0	0
7.	1	4	3	2
8.	4	1	0	0
9.	1	0	3	1
10.	16	64	0	0
11.	0	0	0	0
12.	1	0	0	0
13.	5	18	0	0
14.	1	0	0	0
15.				
16.	3	55	0	0
17.	2	1	7	4
18.	0	0	0	0
19.				
20.	6	2	0	0
21.	5	2	2	1
22.	2	1	2	1
23.	1	0	0	0
24.	2	0	0	0
25.	1	0	0	0
26.	1	2	1	1
27.	1	2	2	1
28.	8	146	1	0
29.	1	0	0	0
30.	5	8	0	0
31.	0	0	0	0
32.	2	1	0	0



RAW DATA

MOTHER	EXTERNAL GLANCES MOTHER	DURATION EXTERNAL GLANCES	EXTERNAL GLANCES CHILD	DURATION EXTERNAL GLANCES
1.	4	2	15	23
2.	3	1	11	20
3.	5	5	9	19
4.	4	5	25	24
5.	3	9	35	84
6.	5	2	13	16
7.	3	3	10	30
8.	2	0	11	14
9.	2	1	2	5
10.	0	0	0	0
11.	0	0	1	3
12.	12	7	14	31
13.	5	4	18	62
14.	4	7	4	1
15.				
16.	9	3	9	17
17.	9	14	8	13
18.	4	2	17	68
19.				
20.	3	1	1	0
21.	18	33	8	7
22.	4	4	18	22
23.	6	7	9	19
24.	4	2	6	4
25.	7	6	8	20
26.	0	0	4	3
27.	3	1	7	13
28.	2	2	6	7
29.	8	7	9	14
30.	0	0	9	27
31.	0	0	12	34
32.	13	5	19	38





RAW DATA

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MOTHER	ELBOW LEAN BY CHILD	DURATION OF ELBOW LEAN	MOVEMENT IN CHAIR BY CHILD	DURATION OF MOVEMENT BY CHILD
<hr/>				
1.	34	127	5	2
2.	12	120	13	15
3.	18	55	4	2
4.	7	16	7	23
5.	38	25	10	14
6.	24	190	5	2
7.	27	288	5	9
8.	10	206	7	3
9.	20	152	5	2
10.	38	24	14	23
11.	16	220	8	4
12.	17	150	4	2
13.	25	150	11	20
14.	3	12	2	11
15.				
16.	24	107	7	18
17.	25	44	26	40
18.	33	174	13	11
19.				
20.	19	109	1	0
21.	35	273	10	47
22.	34	200	3	1
23.	1	0	2	3
24.	18	50	6	3
25.	10	41	4	8
26.	9	35	12	28
27.	13	110	3	7
28.	5	5	6	2
29.	23	124	6	14
30.	15	150	2	11
31.	33	153	1	1
32.	69	903	23	43

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## RAW DATA

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MOTHER	NUMBER OF POSITIVE HEAD MOVEMENTS BY CHILD	DURATION POSITIVE HEAD MOVEMENTS	NUMBER OF NEGATIVE HEAD MOVEMENTS BY CHILD	DURATION OF NEGATIVE HEAD MOVEMENTS
1.	20	5	8	2
2.	17	4	10	3
3.	6	1	8	2
4.	8	7	2	1
5.	29	8	4	1
6.	30	12	12	2
7.	19	6	6	1
8.	28	9	6	2
9.	0	0	0	0
10.	20	11	4	1
11.	12	7	2	1
12.	8	2	3	1
13.	29	10	8	2
14.	5	1	1	0
15.				
16.	18	3	7	2
17.	5	1	2	0
18.	10	3	6	2
19.				
20.	19	8	6	2
21.	12	6	10	4
22.	3	1	3	1
23.	14	6	6	3
24.	5	2	0	0
25.	5	2	1	0
26.	13	7	5	2
27.	2	0	2	0
28.	16	21	5	8
29.	1	0	2	1
30.	9	45	15	44
31.	8	23	11	14
32.	6	2	4	1

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RAW DATA

MOTHER	NUMBER OF POSITIVE HEAD MOVEMENTS BY MOTHER	DURATION POSITIVE HEAD MOVEMENTS	NUMBER OF NEGATIVE HEAD MOVEMENTS BY MOTHER	DURATION NEGATIVE HEAD MOVEMENTS
1.	10	3	2	1
2.	3	1	4	1
3.	1	0	0	0
4.	2	1	2	1
5.	25	7	10	3
6.	17	2	10	2
7.	5	1	6	1
8.	26	13	4	1
9.	3	1	1	0
10.	19	7	2	0
11.	16	9	3	0
12.	16	2	2	0
13.	12	3	16	4
14.	1	0	2	0
15.				
16.	3	1	1	0
17.	11	2	0	0
18.	24	4	12	2
19.				
20.	11	4	3	1
21.	20	9	3	1
22.	18	7	3	1
23.	1	0	0	0
24.	8	3	5	2
25.	12	6	10	4
26.	9	2	2	1
27.	3	1	0	0
28.	12	7	4	7
29.	7	2	2	1
30.	0	0	0	0
31.	1	0	2	0
32.	3	1	8	3



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RAW DATA

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MOTHER	ARMS CROSSED BY MOTHER	DURATION OF ARMS CROSSED	ELBOW LEAN BY MOTHER	DURATION OF ELBOW LEAN
1.	33	230	8	12
2.	2	6	0	0
3.	14	319	0	0
4.	27	169	15	38
5.	18	192	11	52
6.	57	805	8	40
7.	20	268	0	0
8.	18	96	27	192
9.	1	5	6	21
10.	6	66	7	28
11.	3	74	0	0
12.	55	350	4	5
13.	27	194	74	653
14.	10	83	8	22
15.				
16.	22	150	8	19
17.	47	503	18	240
18.	5	53	14	62
19.				
20.	7	34	3	14
21.	38	325	7	31
22.	22	240	7	26
23.	36	331	15	165
24.	35	278	8	82
25.	39	374	26	540
26.	19	105	23	144
27.	18	301	13	59
28.	21	274	10	3
29.	14	352	3	0
30.	24	87	14	18
31.	7	21	4	7
32.	50	392	13	184

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RAW DATA

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MOTHER	MUTUAL BODY INCLINATION	DURATION OF BODY INCLINATION
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1.	17	146
2.	12	57
3.	28	107
4.	0	0
5.	17	30
6.	17	51
7.	37	243
8.	35	203
9.	1	26
10.	71	543
11.	1	0
12.	3	13
13.	16	171
14.	1	5
15.		
16.	20	124
17.	27	113
18.	1	1
19.		
20.	14	40
21.	10	68
22.	1	2
23.	1	0
24.	0	0
25.	6	19
26.	24	<b>78</b>
27.	41	369
28.	27	61
29.	1	0
30.	8	10
31.	8	14
32.	9	31

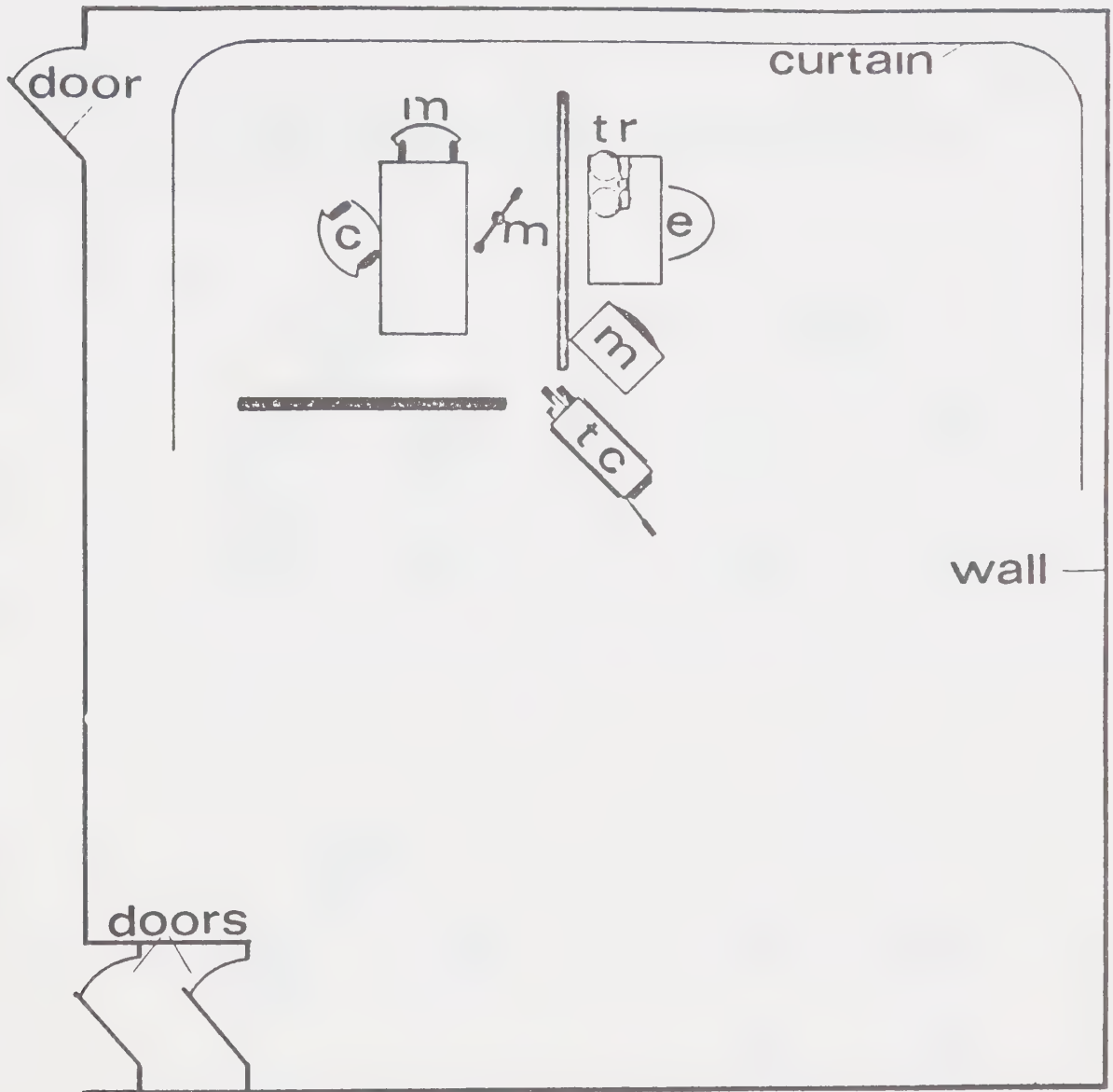
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A P P E N D I X      C



## THE TECHNICAL ARRANGEMENT



### key

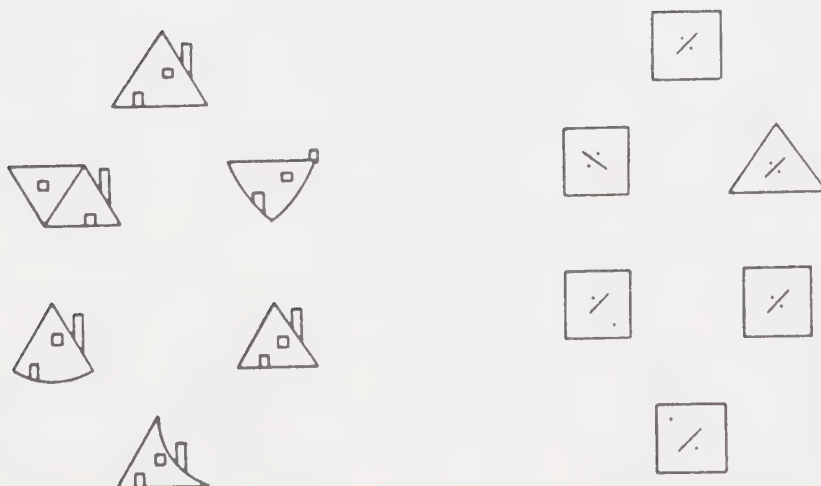
tc	TELEVISION CAMERA
m	MONITOR
e	EXPERIMENTER
tr	TAPE RECORDER
c	CHILD
m	MICROPHONE
m	MOTHER

<sup>1</sup>Brady (1969)





SAMPLE OF CARDS FROM LEARNING STYLE TEST <sup>1</sup>



<sup>1</sup>  
Brady (1969)















